REPORT OF A CASE OF DISSEMINATED GUMMATOUS SPOROTRICHOSIS, WITH LUNG METASTASIS.*

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Diseases due to certain varieties of fungi are claiming more and more attention. Scattered through the literature are many case reports and careful bacteriologic investigations of actinomycosis, blastomycosis, streptothricosis, sporotrichosis, etc. Some of the fungus diseases are primarily pathogenic for animals, and only now and then produce disease in man when conditions are favorable. Many of the forms of fungi occasionally pathogenic for man are, in their natural state, saprophytes on dead vegetables, bark of trees, hay, etc. Gradually the various forms have been differentiated one from another until now there are numbers of well-recognized mycelium-bearing fungi which may cause even fatal disease in man. Among these Gougerot gives an important place to the sporotrichum. In an address delivered in 1913[1] he gives six reasons why sporotrichosis should claim attention:

1. Because of its extreme frequency (in France, at least) and of its universal distribution. There is no part of the civilized globe which has not had its case or cases. In France over 200 cases were reported in the literature from 1906 to the end of 1910. Since then no one reports his cases unless there is something unusual about them.

2. Because of the practical importance from both prognostic and therapeutic standpoints of a correct diagnosis. He cites a number of cases in which the patients were given several months to a year rest-cure under the diagnosis of pulmonary tuberculosis. In 1 case reported a man had had a hip-joint amputation, then a forearm amputation was advised but refused. Diagnosis was corrected and the patient was well in six weeks. One case had severe pharyngeal ulcerations which were thought to be syphilitic. Mercury had been given, with no relief. Diagnosis was finally corrected and the patient was soon cured.

3. Because of the polymorphism of the disease there is no tissue exempt from its ravages, including bone.

He makes three main groups with subgroups:

I. Disseminated sporotrichosis.
   (a) Disseminated gummatous non-ulcerating variety of the skin.

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[1] Gougerot: Sporotrichosis, Jour. State Med., London, December, 1913, 21, 705-768.

(*b*) Subcutaneous ulcerating tuberculoid gummata.
(*c*) Ulcerating syphiloid gummata.
(*d*) Polymorphous sporotrichosis.
II. Localized sporotrichosis.
III. Extracutaneous sporotrichosis—osseous, ocular, visceral, etc.

4. Because of the great ease in diagnosis one does not need a laboratory nor does he need to be an expert bacteriologist. He does need, however, tubes of glucose-agar. By inoculating a tube with some of the purulent material in the ulcers or abscess and placing it aside at room temperature for four to ten days the microscopic appearance is characteristic.

5. Because of the almost certain healing of even the most extensive lesions by the internal administration of KI, necessitating no loss of time by the patient from his daily occupation.

6. Because in the intensive study of the disease a new impetus was given to the study of mycotic diseases in general.

The honor of calling attention to the pathogenicity of the sporotrichum goes to B. F. Schenck,[2] of Johns Hopkins, who in 1898 published an article in the *Bulletin of the Johns Hopkins Hospital* on "Refractory Subcutaneous Abscesses Caused by a Fungus Possibly Related to the Sporotricha." He isolated and grew out the organism which has since been known by the name of Sporothrix Schenckii. In 1900 Hektoen and Perkins published a long article on the sporothrix. The first case published in any other country was that by de Buermann in 1903. Four years elapsed with the report of only 4 cases seen by de Buermann and Gougerot, then the *Bulletin et mémoires de la Société medicale des hôpitaux de Paris* was full of reports. From that time cases have been reported from various countries and from most of the states in the United States. Hyde and Davis,[3] of Chicago, reported on the disease in 1910.

In 1912, Ruediger[4] was able to collect 57 cases from the American literature. Only 24 of these were culturally proved cases. There was one brief report of a probable case from northern Wisconsin. An analysis of the cases revealed that the largest number from any single state was from North Dakota and that most of the cases occurred along the valley of the Missouri River.

Sutton[5] had previously reported a case, and within a year 11 cases had been reported from the Missouri Valley.

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[2] Bull. Johns Hopkins Hosp., 1898, 9, 286.

[3] Sporotrichosis in Man, with Incidental Consideration of its Relation to Mycotic Lymphangitis in Horses, Jour. Cutan. Dis., July, 1910, 28, 321. (Complete bibliography to date, including the articles published during 1907 and 1908 in Bull. et mem. Soc. méd. d. hôp. de Paris.)

[4] Sporotrichosis in the United States, Jour. Infect. Dis., 1912, 11, 193.

[5] Sporotrichosis in the Mississippi Basin, ibid., 1914, 63, 1153.

Haynes and Cheney reported the first case in West Virginia in 1914.

Blaisdell,[6] in 1917, reported the first case in New England. None have been reported since, although cases must have been seen since then,

The sporothrix has been found in every tissue of the body. The common type in this country is the localized lesion. Following an injury a nodule appears, often on the tip of a finger, ulcerates and discharges pus. Healing is very slow or does not occur. Within a short time a nodule forms along the lymph channels which drain the part and the lymph vessels become cord-like. Farther up another nodule forms, connected with the first by an indurated line of tissue slightly or not at all reddened. Others may form along the same line, so that a chain of several separate nodules may be seen along the arm or leg. They may ulcerate and cicatrize or become soft and break down with ulceration. Frequently if the nodules are close together the tissues are undermined and a probe may be passed in the subcutaneous tissue from one ulcer to another. As a rule there is not much tendency to spontaneous healing. The ulcers may last for weeks or months. The course is usually very slow. There are no disseminated gummatous lesions reported in this country.

In France especially there have been many widespread subcutaneous nodules and ulcerating forms reported. However widespread the lesions, they always begin as a firm, usually painless but sometimes very tender nodule in the subcutaneous tissue. In the disseminated form every nodule is separate and no cordlike tissue links it to its nearest fellow. After growing to a variable size the skin over the nodule becomes purplish, especially at the apex, and quite thinned, and fluctuation is felt. The nodule breaks, releasing a sanguinopurulent material. There is little or no zone of inflammation around the base of the nodule. The resulting ulcer has a punched-out appearance resembling so much a syphilitic ulcer that many errors in diagnosis have been made. The ulcer may show signs of healing, the base becomes clean and healthy granulations appear, while the epithelium grows in from the periphery. While some may be healing other nodules and ulcers are forming.

Although de Buermann and Gougerot stated, in 1907, that the regional lymphatic glands do not enlarge, this is not altogether true. They do not show the same tendency to become involved as do the glands draining tuberculous or syphilitic skin lesions, but they do enlarge and even become tender in many cases.

De Buermann and Gougerot, in 1907, reported the thirteenth case. This was an ascending gummatous lymphangitis located on the arm of a man, aged fifty-seven years. It was the first case of the kind reported in France. A period of eighteen months elasped between the appearance of the first and second abscess. In this case the axillary glands were not enlarged. That the course of the lymphangitis is not always as described above is shown by the case of Dominici and Rubens. The initial lesion was the result of a finger-cut. Later there were numerous scattered subcutaneous gummata on the arm without lymphangitis and without swelling of the lymph glands.

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[6] A Case of Sporotrichosis; First Case in New England, Jour. Cutan. Dis., 1917, 35, 452.

De Buermann and Gougerot saw a sporotrichal chancre of the forehead.

Alvin and Vallin[7] report a case of a large abscess and fistula in the brow of a woman, aged fifty-one years.

Daulos and Blanc report a case of palpebral sporotrichosis.

Wilder[8] reports conjunctival ulceration, culturally proved, in a laboratory assistant who was working with cultures of the sporothrix, and frequently capillary tubes were broken within ten inches of his eye.

Morax reports a most unusual case of uveal sporotrichosis with secondary episcleral lesions and absence of all other discoverable sporotrichal localizations.

De Buermann and Gougerot reported the first case of sporotrichosis of the pharyngeal mucous membrane. The organism was grown from the ulcer and also from the apparently intact mucous membrane.

Letulle and Klebré, in the course of a report on a case of sporotrichosis of the skin, mouth, pharynx, larynx and trachea in which the whole posterior buccal cavity was a shallow ulcer, say that the sporothrix buermanni can live an indefinite time in a saprophytic state.

Monier-Vinard and Gaucher, in 1907, reported the first case where the sporotrichum was grown from the sputum.

Widal and Weill reported, in 1908, a case of disseminated sporotrichosis with periosteal lesions in which the sporotrichum was recovered from the circulating blood. Widäl and Abrami also showed at this time that the spores of the sporotrichum were agglutinated by the blood of patients affected with the disease in dilutions of 1 to 800. The blood serum of a patient with actinomycosis agglutinated the sporotrichum in dilutions of 1 to 150. Complement fixation with the spores as antigen has also been described.

The disease usually begins as a local lesions at the site of some injury. The fact that the fungus lives as a saprophyte on all kinds of vegetables and dead matter and bark of trees makes it strange that the infections among humans are so few. Some curious sources of infection have been reported. Thus, Sutton reports a case due to a hen-bite, Rouslacroix to a parrot-bite and others to bites of horses.

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[7] Sporotrichosis, Lyon médical, October, 1920, **129**, 859.

[8] Sporotrichosis of the Eye, Jour. Am. Med. Assn., 1914, **62**, 11.

Olson[9] reported a case of the lymphangitic form in a man from North Dakota who had killed and handled many gophers, many of which had sores similar to those on the patient's hand. Many cases began from the crushing of a finger-tip and from cuts while in hay fields. Several cases are reported by the French of disseminated type in which no portal of entry could be found. The patients were vegetable venders and the organism was found on the vegetables.

Meyer[10] thinks that flies may act as passive carriers. In horses, dogs and rats in this country sporotrichosis is found spontaneously.

Davis[11] found that a small epidemic among horses on a farm in North Dakota which was thought to be farcy was sporotrichosis. The disease was also found among horses in Pennsylvania. Bovines do not seem to be susceptible to the disease but the hides may act as transmitters of spores (Meyer).[12]

All the American cases, with few exceptions, which I have been able to find have been of the lymphangitic type. A case reported by Ravogli,[13] in 1913, had a huge tuberculoid ulceration around an elbow.

Hyde and Davis's case was apparently the gummatous form. Le Blanc[14] has recently briefly recorded 2 cases of what had been thought to be pulmonary tuberculosis. He saw a small nodule on the larynx of each one and claimed that he found spores of sporotrichum in the sputum. There were no skin lesions.

Dominguez,[15] of Cuba, reported, in 1914, a case in a tobacco-leaf tester who was ill with fever and with the lung findings of pneumonia. His illness was prolonged and no tubercle bacilli could be found in the sputum. By roentgen-ray plate a shadow was found in the lung. A fungus lesion was then suspected and sporotrichum was grown from the sputum. Later an abscess of the middle ear developed from which sporotrichum was grown. An extradural abscess was operated and drained, but culture was negative for the fungus. The author found sporotrichum on the tobacco leaves.

Besides these lesions cases are reported by the French of genital lesions and muscle and bone lesions, and Councilman grew a sporotrichum from the fluid of a swollen and inflamed knee-joint.

[9] A Case of Sporotrichosis, ibid., September 21, 1912, 59, 941.

[10] The Relation of Animal to Human Sporotrichosis, Jour. Am. Med. Assn., 1915, 65, 579.

[11] Loc. cit.

[12] Loc. cit.

[13] Report of a Case of Sporotrichosis of the Tuberculoid Type, Lancet-Clinic, Cincinnati, 1913, 110, 112.

[14] Le Blanc, F.: Pulmonary Infection by Sporothrix of Schenck, Ill. Med. Jour., December, 1920, 38, 516.

[15] Sporotrichosis with Multiple Localizations, Med. Rec., April 4, 1914, 85, 608.

The case here reported is the only one of its kind recorded up to the present in the United States. The complete report of the bacteriologic, experimental and immunologic studies will be published later by my assistant, Arthur Margot.

Case History. The case is that of a young negro, aged twenty-three years, admitted to the Milwaukee County Hospital March 8, 1920, who had followed the race horses as a stable boy in the southern and western circuits. He was born in Arkansas. Except for his journeys from New Orleans to California with the horses and a recent trip to Detroit he has always lived in the southern part of the country. He came to Milwaukee direct from Detroit and was in the city for five months before he was taken ill.

The family history is negative. As a boy he had measles, whooping-cough and mumps. When nineteen he had swollen and painful joints lasting a month, but was not confined to bed. At the age of fifteen he had both gonorrhea and an "eating chancre" without suppuration of the inguinal glands. He does not drink but smokes cigarettes to excess. He dated his present illness as far back as June, 1919, when he was ill with fever and chills, but was not confined to bed. Ever since then he has felt weak. About two weeks before admission a swelling appeared on the top of the right foot. There were no ulcerations of the toes, but the toes felt "sprung." This swelling was painful, at first hard, then later soft. It broke in about a week and yellow matter came out. It then began to heal. In the meantime nodules appeared on the top of the left foot, on both upper arms, posterior surfaces, both cheek bones and forehead. He became so weak that he entered the hospital.

Physical examination revealed a somewhat emaciated negro of medium height. On the left side of the forehead at the hair line was a soft painful swelling. There was slight dark discoloration of the skin of the nodule, and it was sharply demarcated from the surrounding skin. It measured 2 cm. in diameter and was raised about 1.5 cm. There was a rough bony edge encircling the base, as if the bone had been eroded. Behind the right ear was a tender superficial ulceration covered by a thin crust. The face was distorted by a swelling in the skin over each malar bone. One was somewhat softer than the other. On the exterior surfaces of both lower arms there were nodules, the largest measuring 3 cm. in diameter. All nodules were tender, some were discolored and others were not discolored. All showed more or less fluctuation. They appeared to be in the subcutaneous tissue. In the dorsum of the right foot there were three superficial ulcers, two of them almost healed; one measured 3 x 4 cm. and had a healthy granular base and a punched-out appearance.

There were moïst rales at the bases of both lungs, more numerous on the left side. The skin of the left posterior apex was very sensitive to palpation. The percussion note was slightly impaired and the breath sounds were a trifle harsh. No rales were heard. Over the whole left side the respiratory excursion was slightly limited and the tactile fremitus, percussion note and breath sounds were not as distinct as on the right side.

The heart was not enlarged; there were no murmurs; the rate was 90 to the minute; the pulse was soft and compressible.

The abdomen was retracted; no masses were felt; the liver and spleen were normal in size; the reflexes were normal.

There was irregular fever as high as 103° F. throughout the illness. The urine was normal at first, but later contained a slight amount of albumin, and shortly before death was full of bile pigments. The leukocytes were 17,000; the Wassermann reaction was + + + +.

As soon as he was seen by me he was thought to have an infection with some one of the fungus diseases. A soft nodule was aspirated under aseptic precautions and the yellow blood-stained pus was examined fresh and cultured. A mycelial network was found which on culture proved to be sporothrix.

Suspecting that there might be some lesion in the lung a roentgen-ray plate was made and the sputum examined. Nothing of interest was found in the sputum, which was scanty.

The roentgen-ray plate showed a clear right apex and slightly hazy left apex. There was a large, somewhat circular shadow extending from the right hilum, about 6 cm. in diameter. Radiating from the edge of this were fine linear markings extending into the first interspace and outward to the edge of the outer zone. Along the left heart border was some fine spotting. The left hilum was also increased in size.

In spite of large doses of potassium iodide and of arsphenamine new nodules developed at various places on the arms and legs while those on the face were gradually healing. Over the outer surfaces of both thighs very large undermined nodules developed. Cultures made from the contents of many nodules invariably showed the same sporothrix.

On April 1, it was noted that on the inner side of the middle of the left thigh was an elongated hard nodule from which a cord-like induration extended a short distance in both directions. Shortly after this he developed intense jaundice. One nodule over the left malar bone had increased in size; the skin was thin and bluish, but there was no elevation of temperature; 10 cc of a yellow purulent blood-stained fluid were aspirated from this nodule.

The patient gradually grew worse. Many nodules were open and were draining freely. The temperature was always elevated. He died on May 23, 1920.

It was not possible to autopsy the body until June 2, 1920, ten days after death. The report of Dr. Margot is as follows:

The body is that of a large-framed but extremely emaciated male negro. The legs and arms are swathed in bandages. Upon removal there are seen huge ulcerating surfaces with undermined discolored skin, one enormous cavity occupying a large part of the outer surface of the left thigh. At the scalp margin on the brow are two punched-out ulcerations. In the skin over the right malar bone is a fluctuating tumor 4 cm. in diameter and 2 cm. above the skin level. Over the left malar bone is a similar but larger nodule. The conjunctivæ have an icteric tint. The pupils are equal but rather large. Rigor mortis is present, postmortem lividity is marked. There is no edema.

Thorax. On removing the sternum the left lung lies entirely free from adhesions but shows a slight hypostatic congestion in the posterior portion of the lower lobe. There is an area of congestion on the posterior surface of the lower lobe of the right lung. A nodule about 1.5 cm. in diameter is found in the upper right lobe having the characteristics of those found in the skin. The mediastinum contains no enlarged glands.

Heart. The pericardium and heart reveal no abnormalities except for probable softening of the muscle.

Abdomen. The abdominal fat is scanty and has a yellow color. The peritoneal surfaces are smooth and glistening. No free fluid is found.

Spleen. The spleen is slightly enlarged; the surface is smooth; color dark; consistency irregular both soft and firm. On section there are dark-red dry areas which are firmer than the rest and extend deep into the spleen. The Malpighian bodies are pretty well seen throughout the cut surface.

Liver. The liver extends 4 cm. below the costal border. It is mottled and the external surface is smooth. It is firm. On section it drips blood. The cut surface is somewhat glistening and the cut edges roll over and the markings are indistinct.

Kidneys. The kidneys are slightly increased in size and are firm. The capsule strips readily from both. Typical cloudy-swelling markings are seen with a swollen cortex.

Gall-Bladder. The gall-bladder is distended and contains about 45 cc of purulent exudate and bile. The wall is thickened and edematous. No stones are found.

Pancreas. The pancreas appears not to be affected.

Microscopic Examination of Tissues. Owing to the fact that the body was ten days in the morgue before autopsy the tissues were more or less autolyzed. However, it was possible to obtain good specimens of the lung. Sections of the nodule in the right lung are made up of connective tissue in which are small round cells, scattered polymorphonuclear leukocytes, plasma cells and large mononuclear cells, probably from the alveolar epithelium. The lung structure is completely obliterated. Many giant cells are present. These have irregular shapes; the protoplasm stains a uniform pink with eosin and the many apparently vesicular nuclei are arranged along the periphery of the cells, at times almost encircling the cell. The resemblance to the giant cells of tuberculous tissue is very close. There are lacking the caseous areas and the tubercle arrangement. There are many distended capillaries throughout.

The kidney sections show marked cloudy swelling with detritus in the collecting tubules. Many Bowman capsules are unusually thickened.

The liver sections show cloudy swelling and congestion of the central veins with atrophy of the liver cells for about one-third to one-fourth of the lobule.

No special changes are seen in the spleen or in a lymph gland at the hilum of the right lung.

Sections from the edge of several of the skin nodules show a connective-tissue stroma infiltrated with leukocytes, round cells and many giant cells much like those found in tuberculosis. Very few eosinophils were seen. Early stages of the nodules are made up of embryologic connective tissue infiltrated with many plasma cells and some polynuclear cells. As the nodule softens the leukocytes increase in number. No proliferation of capillaries is seen. Giant cells are found. It is often quite impossible in certain areas to differentiate these lesions from those of tuberculosis.

We grew the organism from the pus of several nodules on ordinary nutrient agar-agar in the incubator at room temperature. The best media were potato and Sabouraud's glucose peptone agar. At room temperature the growth is slow. In the incubator on agar at the end of twenty-four hours small circular colonies of silky-white appearance are seen and a dense branching, silken, whitish mycelium spreads over the surface. In tubes this penetrates vertically for a distance of 5 to 10 mm. into the depths of the medium. In addition to this adherent layer of interlacing filaments an abdundant aëreal wooly mass of filaments appears within forty-eight hours. Radiations of short filaments from the center of the growth on the agar surface are found from which fruiting hyphæ arise, at the free ends of which are sporangia. The columella, seen after the discharge of spores, projects in a spherical body from the funnel-shaped, expanding end of the supporting hyphæ. The spores are conical in shape; they are chlamydospores (Davis)[16] and measure about 4.5 micra in length, although the range is from 4 to 5 micra.

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[16] Formation of Chlamydospores in Sporothrix Schenckii, Jour. Infect. Dis., November, 1914, 15.

After four to five weeks the growth on the agar or potato appears dry and the color changes from white to mouse gray on to dark brown. De Buermann, who described the first case in France five years after Schenck had published his report, has given his name to the organism, and possibly on account of his many publications the name of the sporotrichum is more widely known under the name sporothrix buermanni than under its correct name, sporothrix schenckii. Priority, however, in this case is undisputed and the organism should be known by its original name.

It would appear that de Buermann's organism and our organism are slightly different in their pathogenicity from the one described by Schenck and the ones described by Hektoen and Perkins, Hyde and Davis and others in this country. The difference lies in the ability of the first group to produce lung lesions in albino rats, whereas no lung lesions were ever produced by any of the previously described American sporotricha. Culturally there is no essential difference. Since Davis reported that the sporothrix schenckii produced chlamydospores, that distinction of the two species no longer served to differentiate them.

It is interesting that our case, the only one reported in this country which is similar to the gummatous cases reported in France, should be caused by a sporotrichum different in pathogenicity from all the reported American cases, but like that reported by the French investigators. We procured cultures from various parts of the country and injected them into rats. Our culture was the only one which produced lung lesions.

The spores alone develop and germinate in the organs of animals (Margot). An emulsion of spores was injected intravenously into rabbits, albino rats and guinea-pigs. Within ten to twelve days the animals developed cachexia, and if not killed died from the injection. Autopsy showed nodules scattered in the liver, kidney, spleen and brain. The nodules were subcapsular, deep, isolated and conglomerate. Cultures from the organs developed typical mycelium.

Only in the albino rats were lung lesions produced. Inoculation by any route invariably produced nodules in the lungs. The histologic appearance of the nodules was similar always, only varying in the proportion of giant cells and other formed elements. No spores were definitely found in the giant cells.

Our organism was agglutinated by the patient's blood (sporoagglutination) in dilution of 1 to 150. Control sera gave no agglutination.

By using an emulsion of crushed spores as antigen, complement fixation was obtained. Unfortunately we neglected to draw blood from the living patient for culture. The result would have been interesting but of no value in diagnosis.

Summary. A case of disseminated gummatous sporotrichosis in a young colored man is reported. There was a nodule in the right lung, suspected on physical examination, seen in the roentgen-ray plate and confirmed at autopsy culturally and histologically. This is the first case of its kind reported in American literature. The sporotricha reported from American cases and some reported from French cases differ in the pathogenicity and in the ability to produce lung lesions in albino rats.

Attention is again called to sporotrichosis as a generalized disease and to the probability of cases of lung sporotrichosis which are unrecognized.

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COMPARATIVE PROGNOSIS IN TUBERCULOUS LESIONS OF THE RIGHT AND LEFT LUNG. A STUDY OF 1048 CASES.

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Very few, and somewhat conflicting, are the recorded observations on the comparative prognosis of right- and left-sided tuberculous lesions and bilateral lesions in which one lung is more extensively involved. Brown[1] maintains that there is no difference in gravity between lesions of the right and the left lung. On the other hand, other observers speak of the mildness of right-side lesions in comparison with those of the left side, and point to the less favorable prognosis in lesions of the left lung. Text-books on the subject shed but little light on this phase of pulmonary tuberculosis, and references to such investigations cannot be found in most standard works on disease of the lungs. It is evident, therefore, that this subject will stand further investigation.

In reviewing the extensive literature on therapeutic pneumothorax one is impressed with the fact that the number of left lungs collapsed is far greater than that of the right, notwithstanding that, generally considered, the left lung is less frequently involved in pulmonary tuberculosis. This would indicate a greater frequency of severe lesions in the left lung. Impressed with this occurrence, Tecon and Aimard,[2] Mark[3] and others have carefully analyzed the data at their disposal. They conclude that as the disease advances there is a great preponderance of left-side lesions, and that a tuberculous condition in the left lung is of more serious import than one in the right and demands a more guarded prognosis. Mayer,[4] Cavalcanti,[5] Strandgaard[6] and others, although unable to confirm the above observation as regard the much greater frequency of left-lung involvements in the advanced stages of phthisis, agree, nevertheless, that the prognosis is less favorable in those whose predominating lesion is in the left lung.

The 1048 cases which form the basis of this communication were observed for from five months to several years. They were all subjected to repeated roentgenological examinations, and their diagnosis was clear cut. The classification of the National Tuberculosis Association was strictly adhered to, both in regard to diagnosis on admission and condition on discharge.

TABLE I.—LUNG INVOLVEMENTS IN 1048 CASES

Right lung only.	Left lung only.	Both lungs.	
		Right lung most.	Left lung most.
326, or 31.1 per cent	152, or 14.5 per cent	344, or 32.8 per cent	226, or 21.6 per cent

The figures of Table I show that of the 1048 cases studied, 152, or 14.5 per cent, suffered from tuberculosis of the left lung only and 226 from bilateral pulmonary tuberculosis with preponderating left-side involvement, or a total of 36.1 per cent of preponderating left-lung lesions; while 326, or 31.1 per cent, suffered from right-side lesions only, and 344, or 32.8 per cent, were afflicted with bilateral lesions in which the right side was more extensively involved; or a total of preponderating lesions of the right lung of 63.9 per cent. In other words, in unilateral lesions, the percentage of right-side involvement was about 2 to 1 as compared with